

Editorial Board Report

Chiara la Tessa, Marie Vanstalle, Mauro Villa

Strasbourg meeting _ 10/06/2020



Outline

- New EB, Meetings and internal working
- Papers
- Conferences
- Forthcoming activities

New EB, Meetings and internal working

- New EB (Chiara, Marie, Mauro) took over from previous EB: Roberto Spighi, Ronja Hetzel, Giovanni de Lellis
- Transition meeting on 9 jan 2020 with Roberto providing us all the information, tips and tricks
thanks a lot!
- Then, planned meetings every 4 weeks
(short and quite effective!)
- Online repository on google drive for an easy access of EB relevant information: conference lists, author lists, proceedings, paper writings ecc ecc



New EB, Meetings and internal working

- **Work sharing:**

- Papers/proceedings are reviewed by all EB members
- Conference searches by all
- Conference advertisements is done by all EB members
- Every interesting conference is assigned to one EB member
 - She/he will follow the candidate speakers or poster presenters in all phases
 - Abstract submission/presentation rehearsal/proceeding writing and submission



Papers - published

Two papers have been published since last meeting (december)

Detector paper
by the Pisa group

Nuclear Inst. and Methods in Physics Research, A 953 (2020) 163146

Contents lists available at [ScienceDirect](#)



Nuclear Inst. and Methods in Physics Research, A

journal homepage: www.elsevier.com/locate/nima

Fragment charge identification technique with a plastic scintillator detector using clinical carbon beams

FOOT Paper on
IEEE Tran on Rad and
Plasma Med science

[Journals & Magazines](#) > [IEEE Transactions on Radiatio...](#) > [Volume: 4 Issue: 2](#)

Measurement of ^{12}C Fragmentation Cross Sections on C, O, and H in the Energy Range of Interest for Particle Therapy Applications

Publisher: IEEE

[Cite This](#)

[PDF](#)

96 Author(s)

I. Mattei [ID](#) ; A. Alexandrov ; L. Alunni Solestizi ; G. Ambrosi [ID](#) ; S. Argirò ; N. Bartosik ; G. Battistoni [ID](#) ; N. ...

Detector paper



Frontiers in Physics special issue.

Tight deadline: 31/05/2020. Thanks to Marco for having done it on time!

Goal: to describe the FOOT Detector(s), key ideas, expected performances
(no physics results)

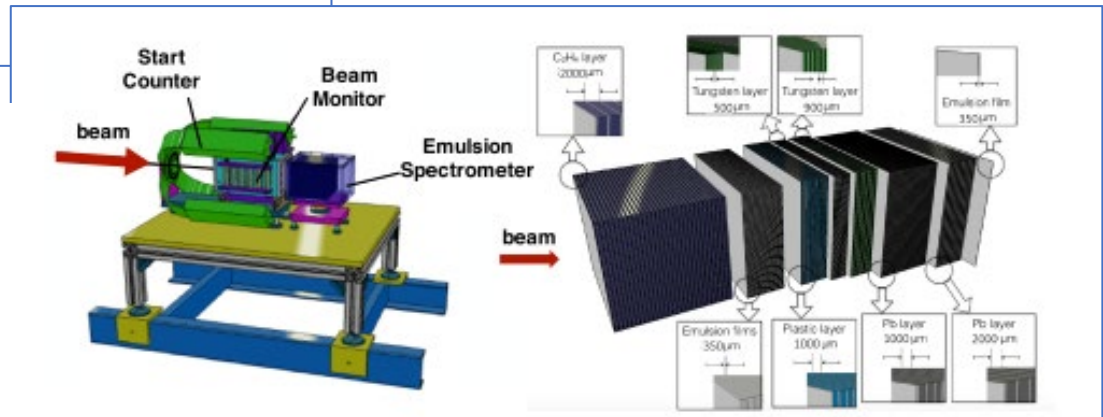
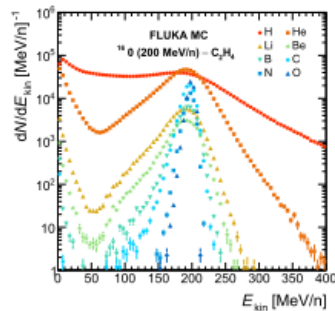
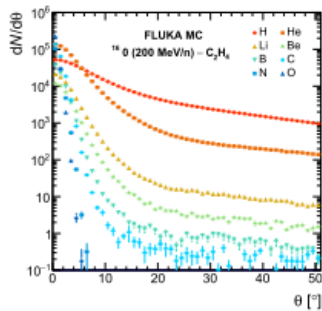
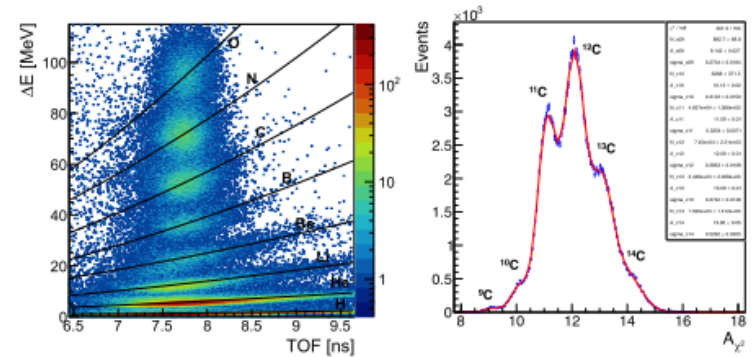
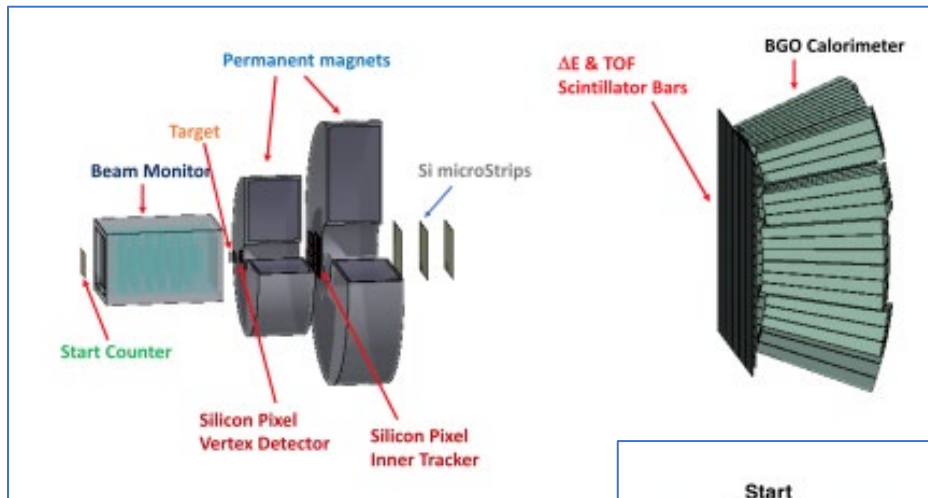
G. Battistoni et al.

The FOOT experiment

Measuring the impact of Nuclear Interaction in Particle Therapy and in Radio Protection in Space: the FOOT experiment.

G. Battistoni⁸ M. Toppi^{7,22,*} A. Alexandrov^{10,19,33,34} B. Alpat¹¹ G. Ambrosi¹¹

Detector paper



Beam Monitor Paper

Title: **The Drift Chamber detector of the FOOT experiment: performance analysis and external calibration.**

Data: proton @ 80 and 228 MeV kinetic energy collected at Trento in 2018.

Detectors: Beam Monitor + MSD (old version)+Margherita

Target journal: NIM

In circulation within the collaboration now. Deadline for comments: **18 june**

Thanks to Yun for the effort of writing coordination

Beam Monitor Paper

Main results:

Single hit efficiency: $92.9 \pm 0.8\%$

Spatial resolution:

$150 \pm 10 \mu\text{m}$ @228 MeV/n,

$300 \pm 10 \mu\text{m}$ @80 MeV/n

Intrinsic spatial resolution:

60-100 μm

Angular resolution:

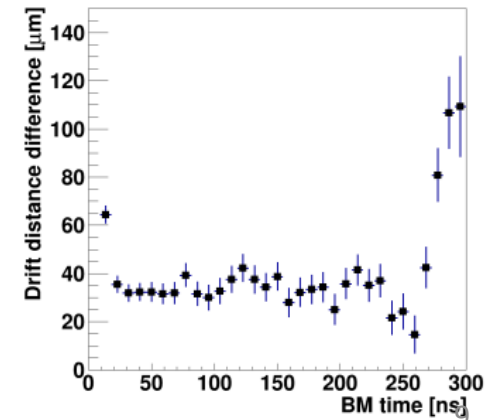
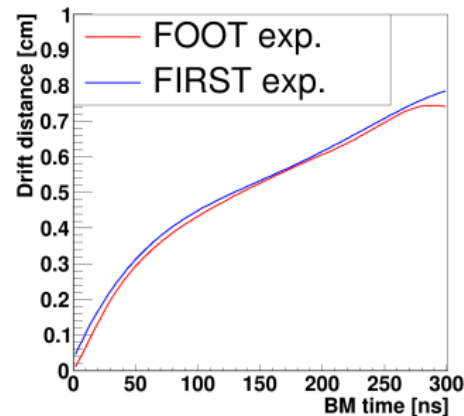
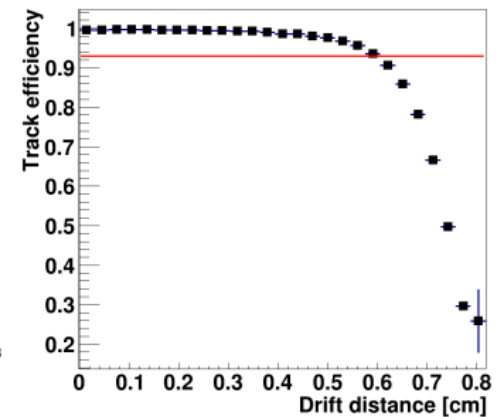
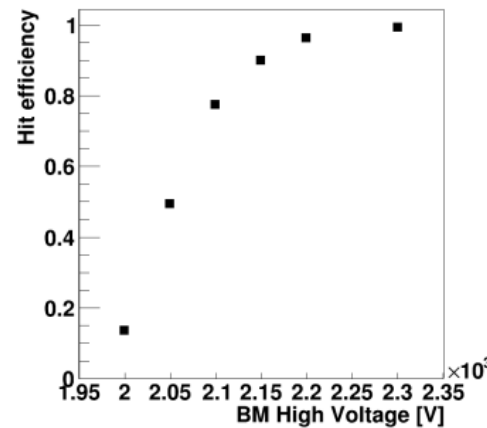
$1.62 \pm 0.16 \text{ mrad}$ @228 MeV/n,

$2.1 \pm 0.4 \text{ mrad}$ @ 80MeV/n

Tracking efficiency:

$99.1 \pm 0.1 \%$ (before cuts)

And of course the r - t relation



Papers in the writing stage

A. Kraan et al,

Charge identification of nuclear fragments with the FOOT Time-Of-Flight system

Abstract. FOOT (FragmentatiOn On Target) is an applied nuclear physics experiment designed for measuring with high precision the production cross sections of nuclear fragments for energies, beams and targets relevant in particle therapy and radioprotection in space. These measurements are important for being able to simulate accurately the characteristics (yield, charge, energy, angle) of produced nuclear fragments in tissue, needed to estimate the radio-biological effectiveness (RBE) of particle beams in biological dose calculations.

An important component of the FOOT experiment is the ΔE -TOF system, which is designed to identify the charge and velocity of nuclear fragments produced in particle collisions in thin targets. The ΔE -TOF system is composed of a start counter, providing the first time stamp for the time-of-flight, and a 40×40 cm² wall of thin plastic scintillators, providing the second time stamp and deposited energy of the fragments passing through the detector. Particle charge discrimination can be achieved by correlating the energy released in the scintillator bars with the measured time-of-flight. Currently, a full-scale ΔE -TOF detector prototype has been constructed.

In this work, we describe the development of an energy and time-of-flight calibration procedure of this ΔE -TOF prototype, as well as its application to a fragmentation measurement of a 400 MeV/u oxygen beam of a thin carbon target. We used data acquired during two test beams at CNAO and GSI with proton, carbon and oxygen beams in the energy range 60 to 400 MeV/u.

Goal: describe the calibration procedure of the TOF system

Data: GSI 2019 and CNAO

Main results:

- Energy calibration
- Energy resolutions
- Time resolutions
- Resolution on Z

Target Journals: NIM, JINSTR, TNS or other similar journals

Time scale:

- June paper completion
- July paper circulation

Papers in the writing stage

M. Morrocchi et al

Performance Evaluation of the TOF-Wall Detector of the FOOT Experiment

Data: CNAO

From what has been presented at NSSMIC 2019 – No conference record or proceeding prepared

Target Journal: Trans. Nucl. Science

(NSSMIC participants are encouraged to submit an article on their contribution to TNS)

Time scale:

- June paper completion
- July paper circulation and submission

Authorship



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A. Schiavi^{12,22} C. Schuy⁶ E. Scifoni¹⁵ A. Sciubba^{7,22} A. Sécher¹⁴ M. Selvi⁴
L. Servoli¹¹ G. Silvestre^{11,24} M. Sitta^{18,17} R. Spighi⁴ E. Spiriti⁷ G. Sportelli^{2,1}
A. Stahl³ S. Tomassini⁷ F. Tommasino^{15,16} G. Traini^{12,26} T. Valeri¹⁰
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V. Patera^{12,22}

Persons relevant in the production of the paper/analysis

Corresponding author
Is usually the person who contributed most to the writings

All others in alphabetical order

«group» leader(s)

Authorship

FOOT collaboration: 96
authors

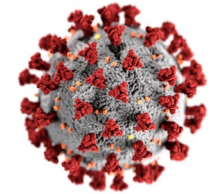
34 Affiliations
(9 founding agencies)

6 Countries
(France, Germany, Italy,
Russia, Cuba, Japan)

3 Continents
(Europe, Asia, America)

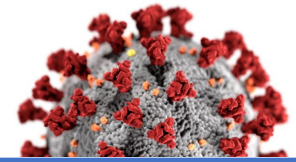
Persons	Place/CITY
2	Aachen
11	Bologna
4	CNAO
8	Frascati
3	GSI
1	GSSI
1	Havana
5	Milano
1	Nagoya
7	Napoli
8	Perugia
13	Pisa
9	Roma 1
3	Strasbourg
2	Tor Vergata
12	Torino
6	Trento

Conferences - (the sad story)



Conference	Where	When	What	Who	conf status	
AccApp'20	Wien	05-apr	poster	L. Servoli	postponed	2016 <input type="checkbox"/> Talk 1
PTCOG59	Taiwan	06-set	poster	G. Traini	postponed to may 2021	
ANPC2020	Prague	13-set	talk	C. Montesi	postponed to 2021	2017
ANPC2020	Prague	13-set	talk	S. Colombi	postponed to 2021	<input type="checkbox"/> Talks: 4
9th ISSRRPR	China	15-apr	talk	Y. Dong	postponed to 2021	
PANIC2020	Lisbon	20-ago	talk	R. Ridolfi	postponed to 2021	
IWORID	Ghent	27-giu	talk	G. Silvestre	postponed to 2021	2018
TIPP 2020	Vancouver	25 may	talk	B. Di Ruzza	cancelled	<input type="checkbox"/> Talks: 12
TIPP 2020	Vancouver	25 may	talk	G. Silvestre	cancelled	<input type="checkbox"/> Posters: 7
RTime 2020	Vietnam	12-ott	talk	L. Galli	moved to october	<input type="checkbox"/> Seminar: 1
NSSMIC 2020	Boston	31-ott	talk	L. Scavarda	confirmed	
NSSMIC 2020	Boston	31-ott	talk	A. Kraan	confirmed	2019
SIF2020	(web)	14-set	talk	C. Montesi	confirmed online	<input type="checkbox"/> Talks: 20
SIF2020	(web)	14-set	talk	R. Ridolfi	confirmed online	<input type="checkbox"/> Posters: 2
SIF2020	(web)	14-set	talk	Y. Dong	confirmed online	
SIF2020	(web)	14-set	talk	G. Galati	confirmed online	
SIF2020	(web)	14-set	talk	G. Silvestre	confirmed online	2020
SIF2020	(web)	14-set	talk	R. Zarrella	confirmed online	<input type="checkbox"/> Talks: 10
Nucleus2020	S.Peters.	11-nov	talk	S. Biondi	confirmed	

Conferences - (the sad story)



Conference	Where	When	conf status
Young Research Meeting	Trento	08-giu	postponed to 2021
PSD 12	Birmingham	07-set	postponed to 2021
Nuclear Physics Persp.	Ischia	17-mag	postponed to 2021
Zakopane Conf Nucl	Zakopane		postponed to 2021
NDIP	Troyes (FR)		postponed to 2021
ENLIGHT2020	Bergen	22-giu	cancelled
RRS 2020	Hawaii	18-ott	online only
ASTRO annual meeting	Miami	25-ago	online only
RAD2020	Herceg Novi	20-lug	Postponed. Deadline 1-july
ICNFP2020 New Frontiers	Crete	4 sett	Deadline 30 june

Last occasions for presenting FOOT at conferences this year!
Contact the EB if you wish to present a contribution.

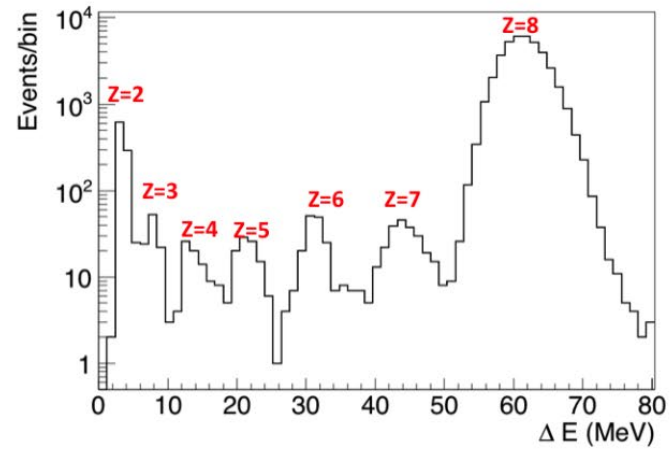
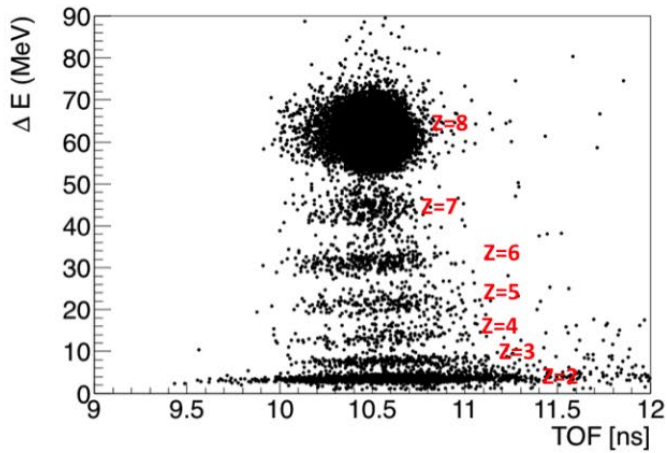
If you are interested also in other conferences, please let us know

Forthcoming papers - physics papers

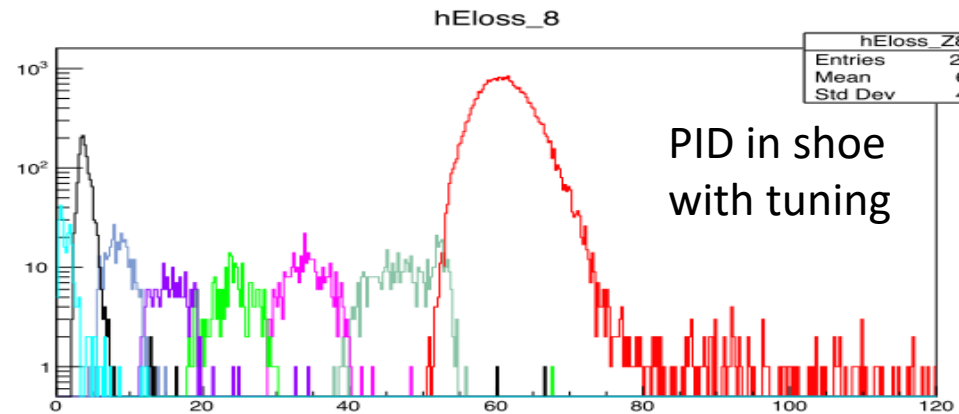
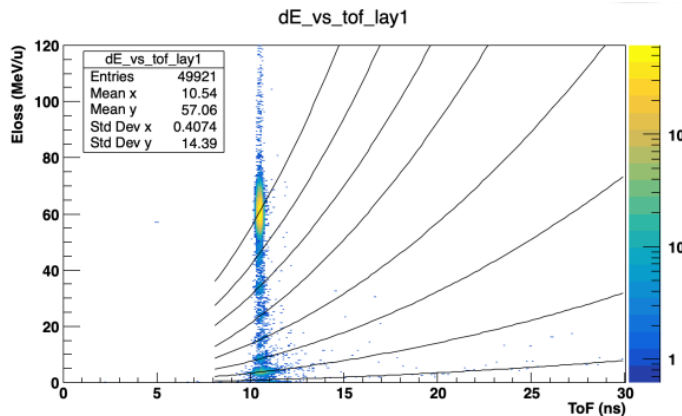
- GSI 2019 – Emulsion runs – ^{16}O @200 MeV/n on C, H targets
 - Cross sections for proton, helium and lithium production in fragmentation processes
 - Expected for the end of the year
 - A paper on GSI 2020 data will follow
- GSI 2019 / CNAO -
 - Nuclear fragments production in ^{16}O @200 MeV/n on C, H targets, $2 < Z < 8$.
 - Based on Z identification on ΔE and TOF measurements
 - Expected for early fall

Forthcoming papers - physics papers

Cross section measurements (no differential) done via Z ID alone



standalone



PID in shoe with tuning

Forthcoming papers - technical papers

- Technical paper on MSD
 - On beam data taken at Trento in 2017/18 (old detector) or forthcoming data on new detectors (to be decided)
- Other technical papers could be foreseen:
 - On performance of the calorimeter (several beam tests have been made)
 - On VTX & ITR performance
 - On DAQ performance

All need dedicated data takings and can be pursued also with part of the detector.

DAQ needs a global data taking (or at least all systems together)

Summary of the publication status

- Published or Accepted Papers

- L. Galli et al., *Fragment charge identification technique with a plastic scintillator detector using clinical carbon*, [NIM A953 \(2020\) 163146](#)
- I. Mattei et al., *Measurement of ^{12}C Fragmentation Cross Sections on C, O and H in the Energy Range of interest for Particle Therapy Applications*, [IEEE Trans. Rad. and Plasma Med. Sciences 4 \(2020\) 269-282](#), doi: 10.1109/TRPMS.2020.2972197

- Submitted papers

- G. Battistoni et al., *Measuring the impact of Nuclear Interaction in Particle Therapy and in Radio Protection in Space: the FOOT experiment*, [Frontier in Physics Special Issue](#) (submitted on 31st may 2020)

- In circulation

- Y. Dong et al., *The Drift Chamber detector of the FOOT experiment: performance analysis and external calibration*, to be submitted on NIM

- In the advanced writing stage

- A. Kraan et al., *Charge identification of nuclear fragments with the FOOT Time-Of-Flight system*, for NIM
- M. Morrocchi et al., *Performance Evaluation of the TOF-Wall Detector of the FOOT Experiment*, for Transactions of Nuclear Science

- Forthcoming papers

2 physics papers in 2020

